2005 Salt Lake City Annual Meeting (October 16–19, 2005)

Paper No. 42-6

Presentation Time: 3:00 PM-3:15 PM

A DIRECT-PUSH-BASED GEOCHEMICAL ASSESSMENT OF NATURAL ATTENUATION AT A FORMER UNDERGROUND STORAGE TANK SITE

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Long-term assessment of passive remedial strategies can be difficult to implement at ground-water contamination sites where monitoring wells have been removed or structural modifications have been made. We assessed the longevity of BTEX contamination at a site that was released from regulatory oversight five years ago, using a new direct-push-based geochemical profiling approach. Samples were obtained from up to seven depths in multiple probeholes to evaluate post-site closure levels of contamination and verify predictions made regarding natural attenuation processes. Field measurement of redox-sensitive indicators of contaminant degradation (dissolved oxygen, total and ferrous iron, manganese, sulfate, oxidation-reduction potential and specific conductance) was made at each depth prior to the collection of samples for laboratory analysis of major ions and organic contaminants. High dissolved iron concentrations coincided with contaminated groundwater and served as a field proxy for defining the extent of contamination. The presence of dissolved iron was consistent with expectations regarding iron-reducing conditions. Longitudinal and transverse chemical profiles within the contaminated region, however, revealed high sulfate and manganese zones, and confounded original interpretations based on the progression of TEAPs. The anomalous zones were characterized by high specific conductance values and believed to result from focused influx of roadside storm-water runoff and road salt. Recent road construction appeared to further impact the distribution of contaminants, as storm-sewer drainage modifications altered the original hydraulic gradient. The versatility of the new approach enabled verification of ongoing natural attenuation processes without the installation of new monitoring wells. It also demonstrated the importance of considering the impact that post-site closure modifications may have on assumptions regarding contaminant degradation.

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General Information for this Meeting

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